Improving Equality of Opportunity
New Insights from Big Data

Raj Chetty
The Equality of Opportunity Project
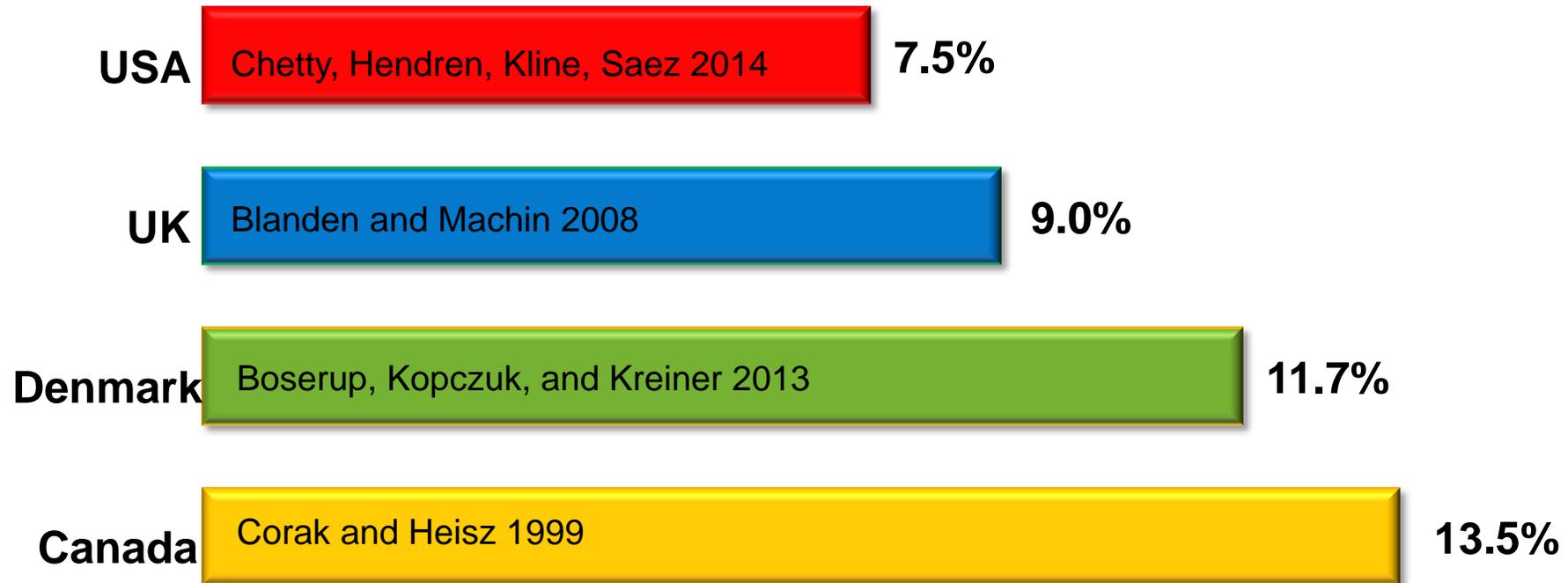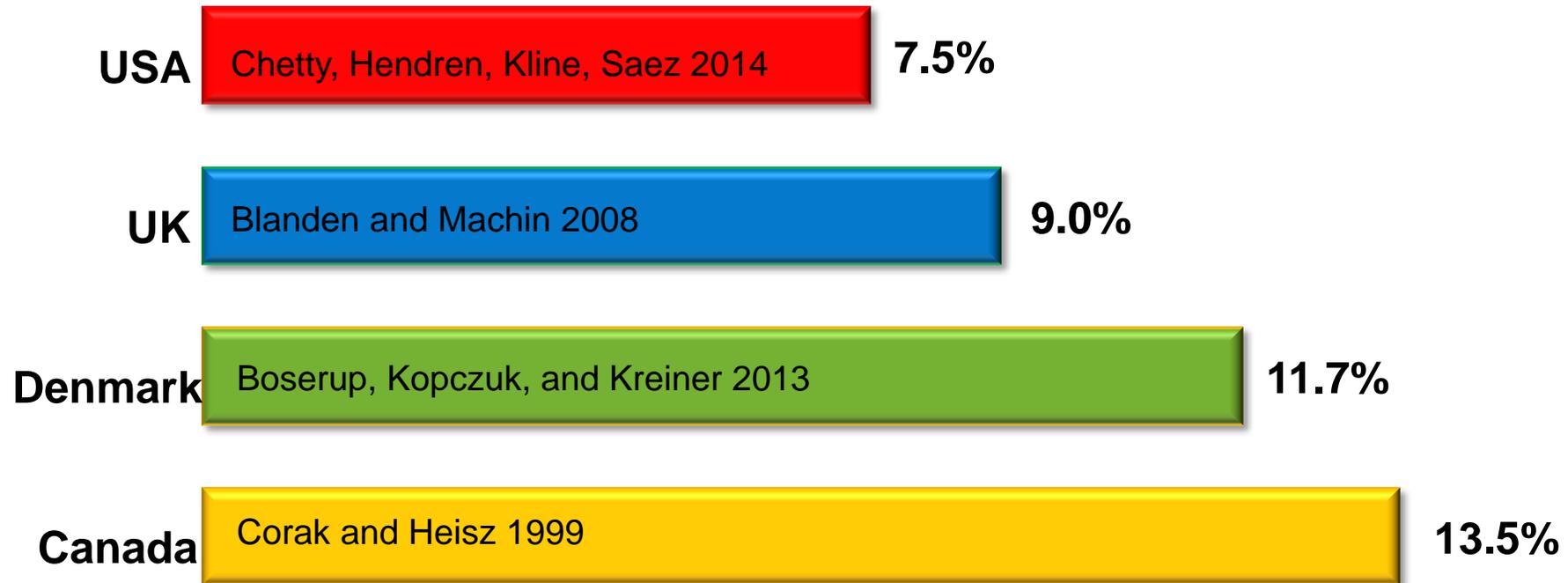Stanford University

November 2017

The American Dream?

- Chance that a child born to parents in the bottom fifth of the income distribution reaches the top fifth:

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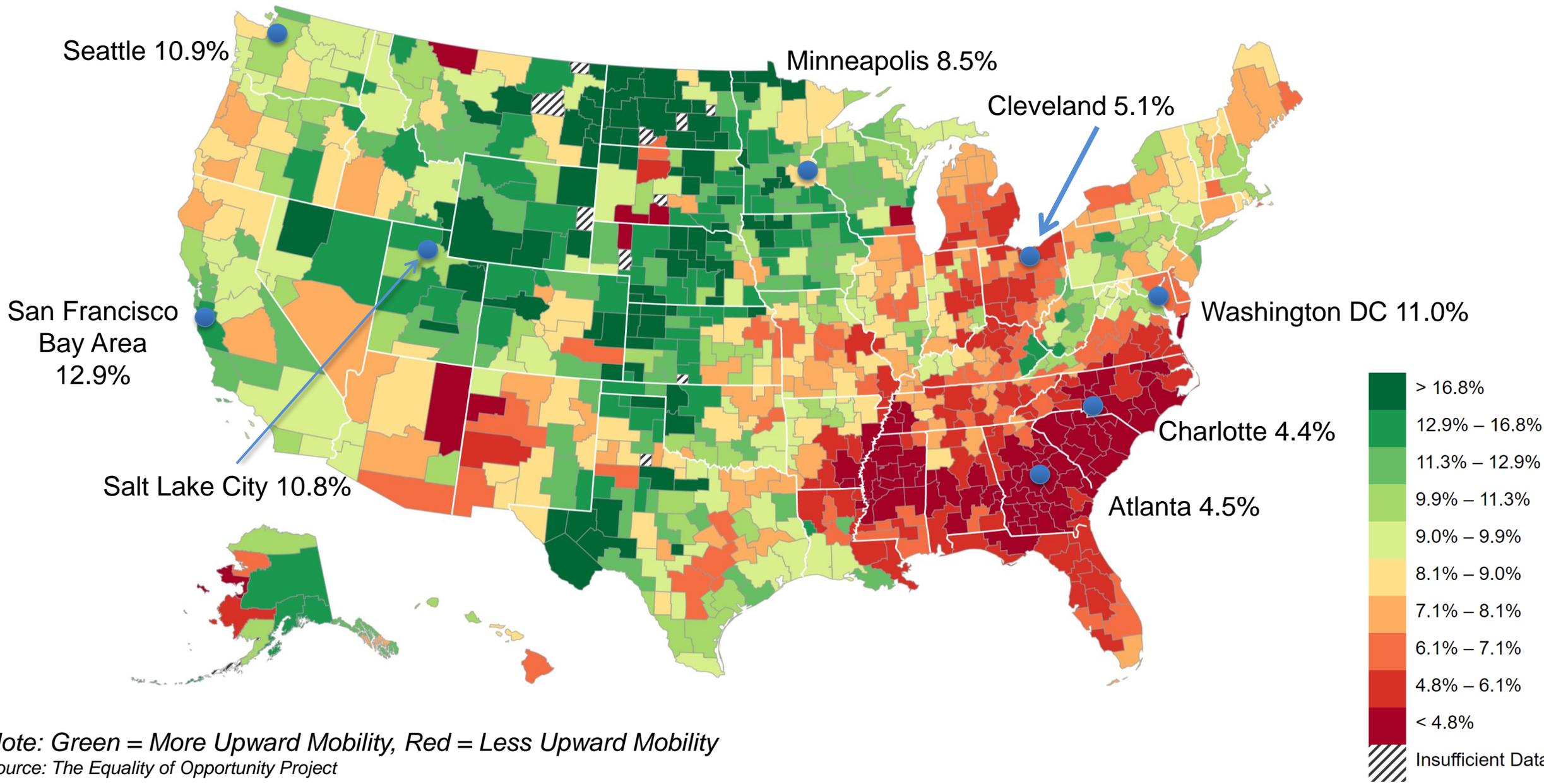
USA — Chetty, Hendren, Kline, Saez 2014 — **7.5%**

UK — Blanden and Machin 2008 — **9.0%**

Denmark — Boserup, Kopczuk, and Kreiner 2013 — **11.7%**

Canada — Corak and Heisz 1999 — **13.5%**

The American Dream?

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→ Chances of achieving the "American Dream" are almost two times higher in Canada than in the U.S.

Differences in Opportunity Within the U.S.

- Differences across countries have attracted public attention

- But upward mobility varies even more *within* the U.S.

- We calculate upward mobility for every metro and rural area in the U.S.

  - Use anonymous earnings records on 10 million children born between 1980-1982

Source: Chetty, Hendren, Kline, Saez 2014

The Geography of Upward Mobility in the United States
Chances of Reaching the Top Fifth Starting from the Bottom Fifth by Metro Area

Seattle 10.9%

Minneapolis 8.5%

Cleveland 5.1%

San Francisco Bay Area 12.9%

Washington DC 11.0%

Salt Lake City 10.8%

Charlotte 4.4%

Atlanta 4.5%

Legend:
- > 16.8%
- 12.9% – 16.8%
- 11.3% – 12.9%
- 9.9% – 11.3%
- 9.0% – 9.9%
- 8.1% – 9.0%
- 7.1% – 8.1%
- 6.1% – 7.1%
- 4.8% – 6.1%
- < 4.8%
- Insufficient Data

Note: Green = More Upward Mobility, Red = Less Upward Mobility
Source: The Equality of Opportunity Project

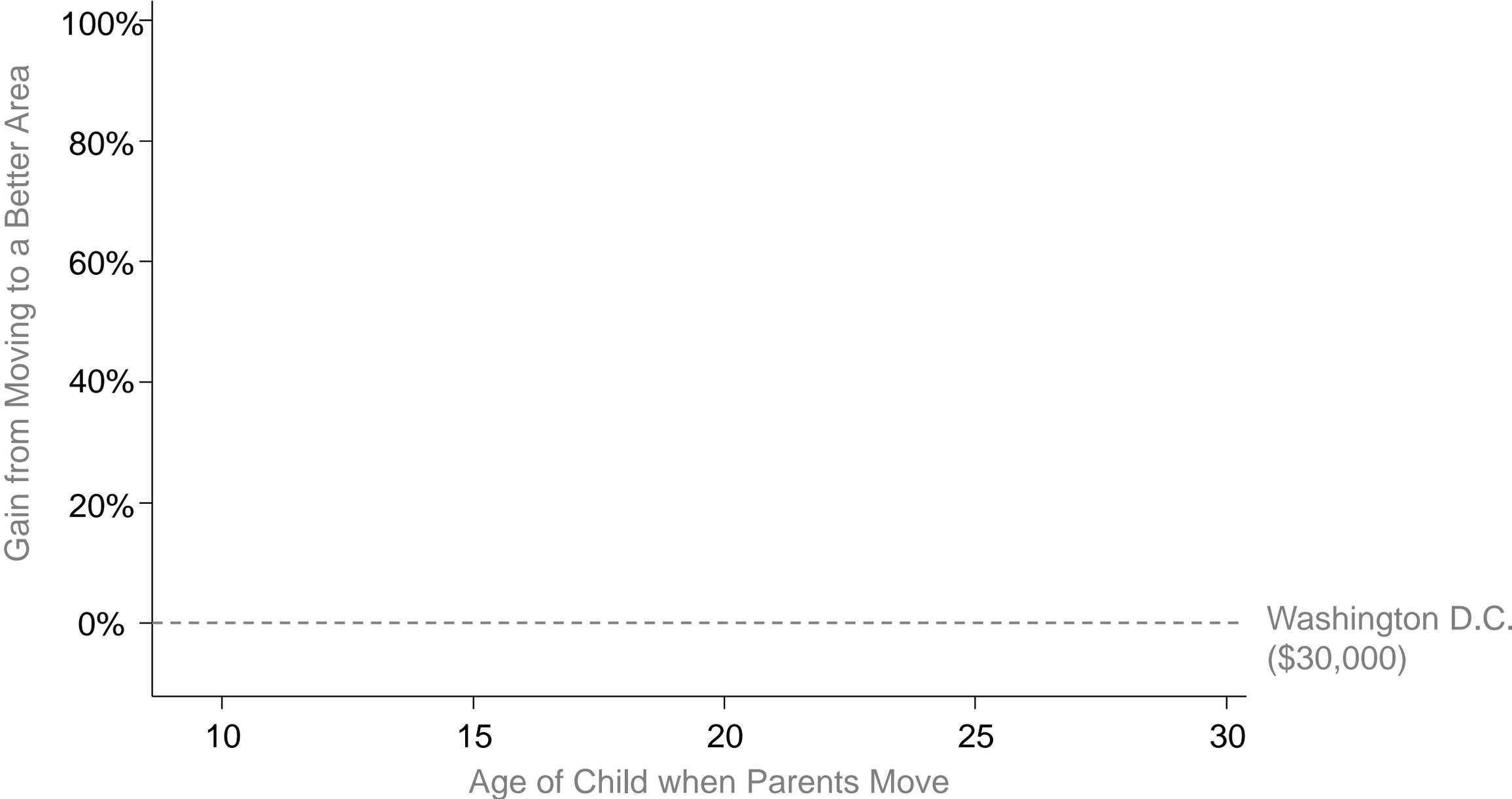# The Geography of Upward Mobility in the DC Metro Area
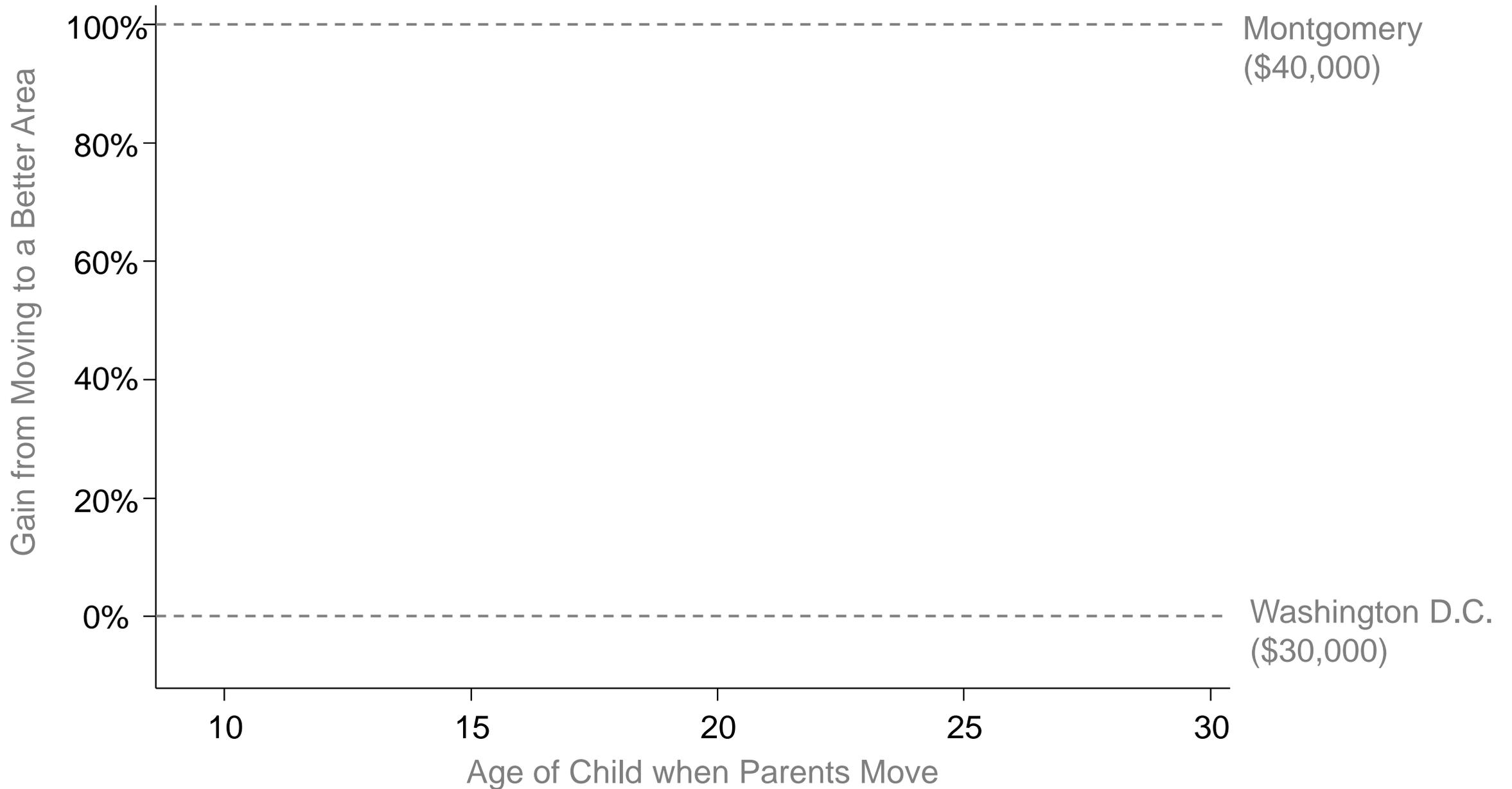## Chances of Reaching the Top Fifth Starting from the Bottom Fifth by County

Montgomery
16.1%

Fauquier
7.4%

D.C.
4.5%

Prince William
13.7%

> 25.3%

18.5 − 25.3

15.4 − 18.5

14.2 − 15.4

13.7 − 14.2

12.8 − 13.7

10.8 − 12.8

9.7 − 10.8

7.5 − 9.7

< 7.5%
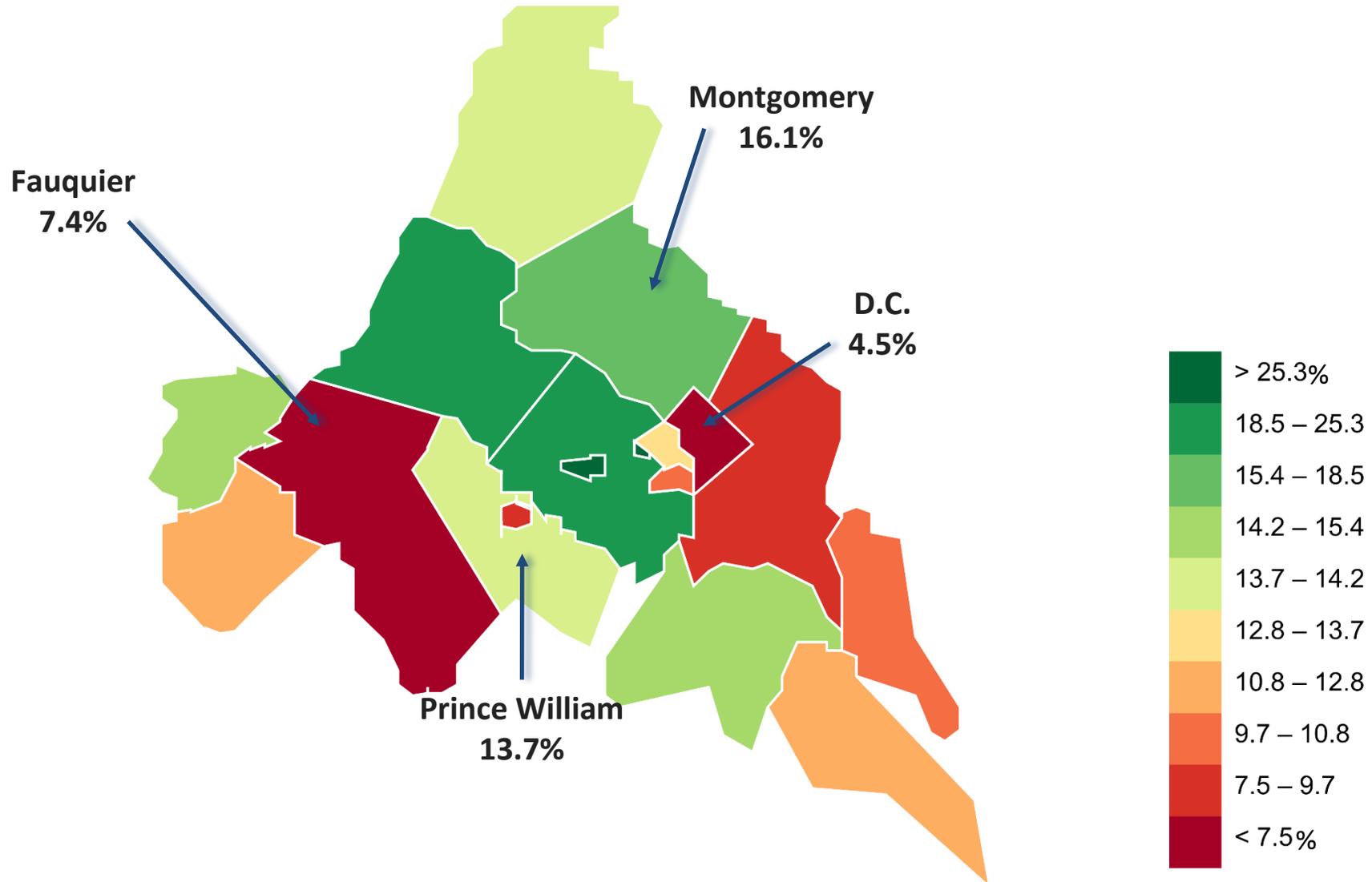
Why Does Upward Mobility Differ Across Areas?
The Importance of Childhood Environment

- Most of the variation in upward mobility across areas is caused by differences in childhood environment

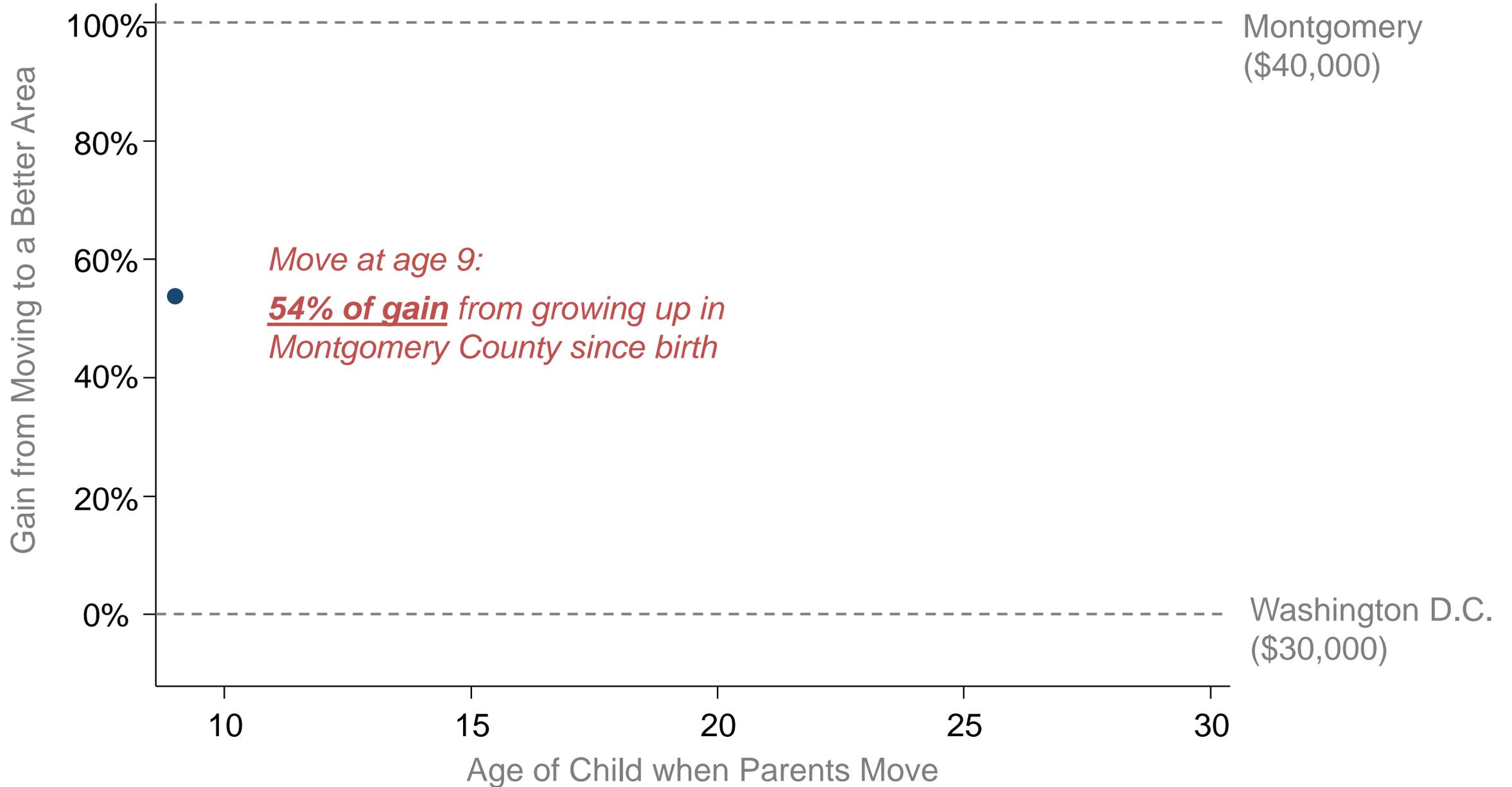- Demonstrate this by studying 7 million families that move between areas in the U.S.

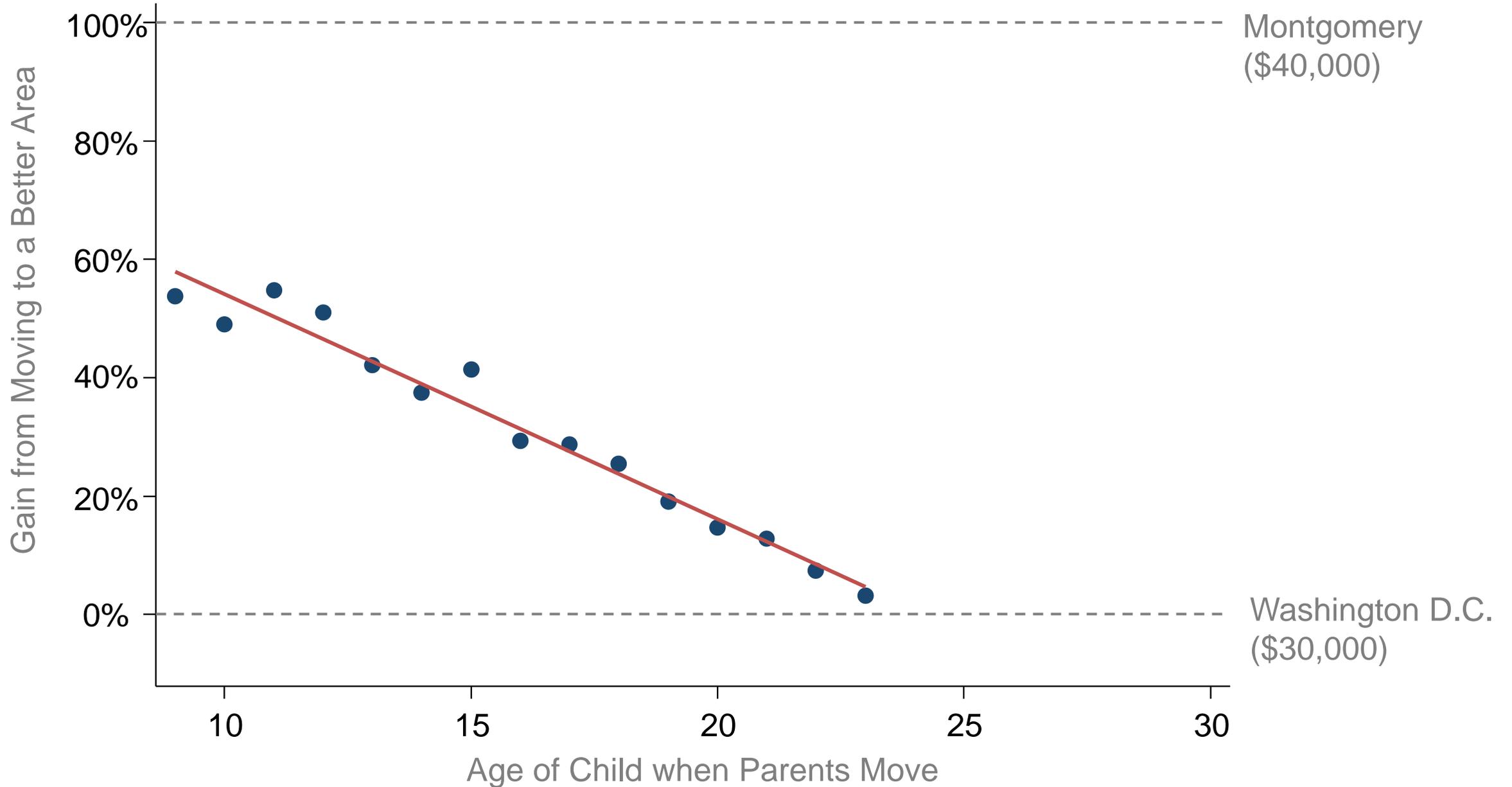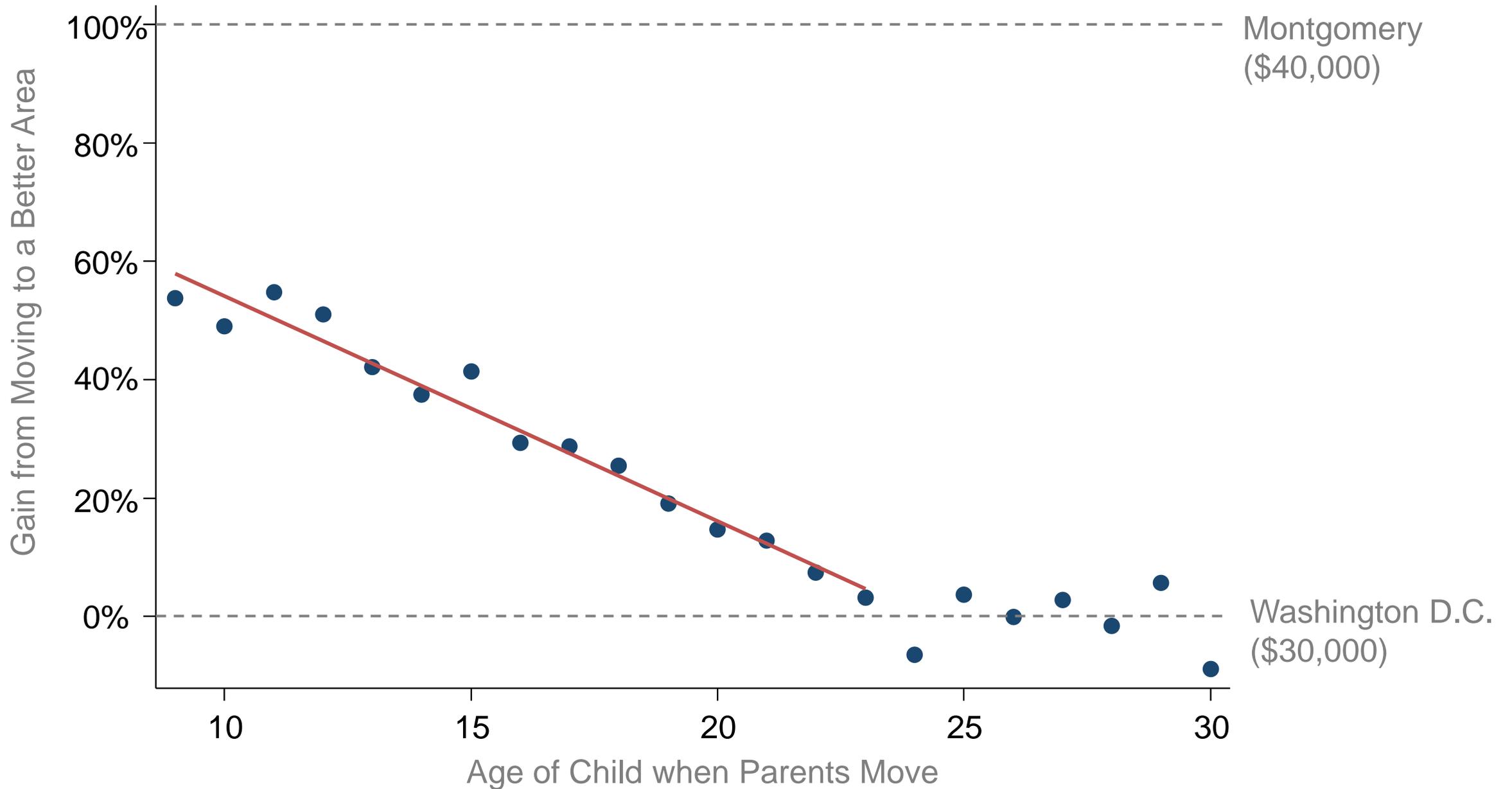# Earnings Gain from Moving to a Better Neighborhood

Gain from Moving to a Better Area

Age of Child when Parents Move

Washington D.C.
($30,000)

100%

80%

60%

40%

20%

0%

10   15   20   25   30

Earnings Gain from Moving to a Better Neighborhood

Montgomery ($40,000)

Washington D.C. ($30,000)

Gain from Moving to a Better Area

100%

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0%

10   15   20   25   30

Age of Child when Parents Move

Earnings Gain from Moving to a Better Neighborhood

Montgomery
($40,000)

Washington D.C.
($30,000)

Move at age 9:

54% of gain *from growing up in*
Montgomery County since birth

Gain from Moving to a Better Area

Age of Child when Parents Move

Earnings Gain from Moving to a Better Neighborhood

Earnings Gain from Moving to a Better Neighborhood

Montgomery ($40,000)

Washington D.C. ($30,000)

Y-axis: Gain from Moving to a Better Area

X-axis: Age of Child when Parents Move

Two Policy Approaches to Increasing Upward Mobility

- Importance of place for mobility motivates two types of policies:

  1. Choice-based: help people move to better areas

  2. Place-based: invest in low-opportunity places to replicate successes of areas with high upward mobility

Policy Approach 1: Moving to Opportunity

- One way to improve outcomes: give low income families subsidized housing vouchers to move to better areas

  - U.S. already spends $45 bil per year on affordable housing, but most affordable housing is in low-opportunity areas

- HUD Moving to Opportunity Experiment: gave vouchers to move to better areas using a randomized lottery

  - 4,600 families in Boston, New York, LA, Chicago, and Baltimore in mid 1990's

Source: Chetty, Hendren, and Katz 2016

Common MTO Residential Locations in New York
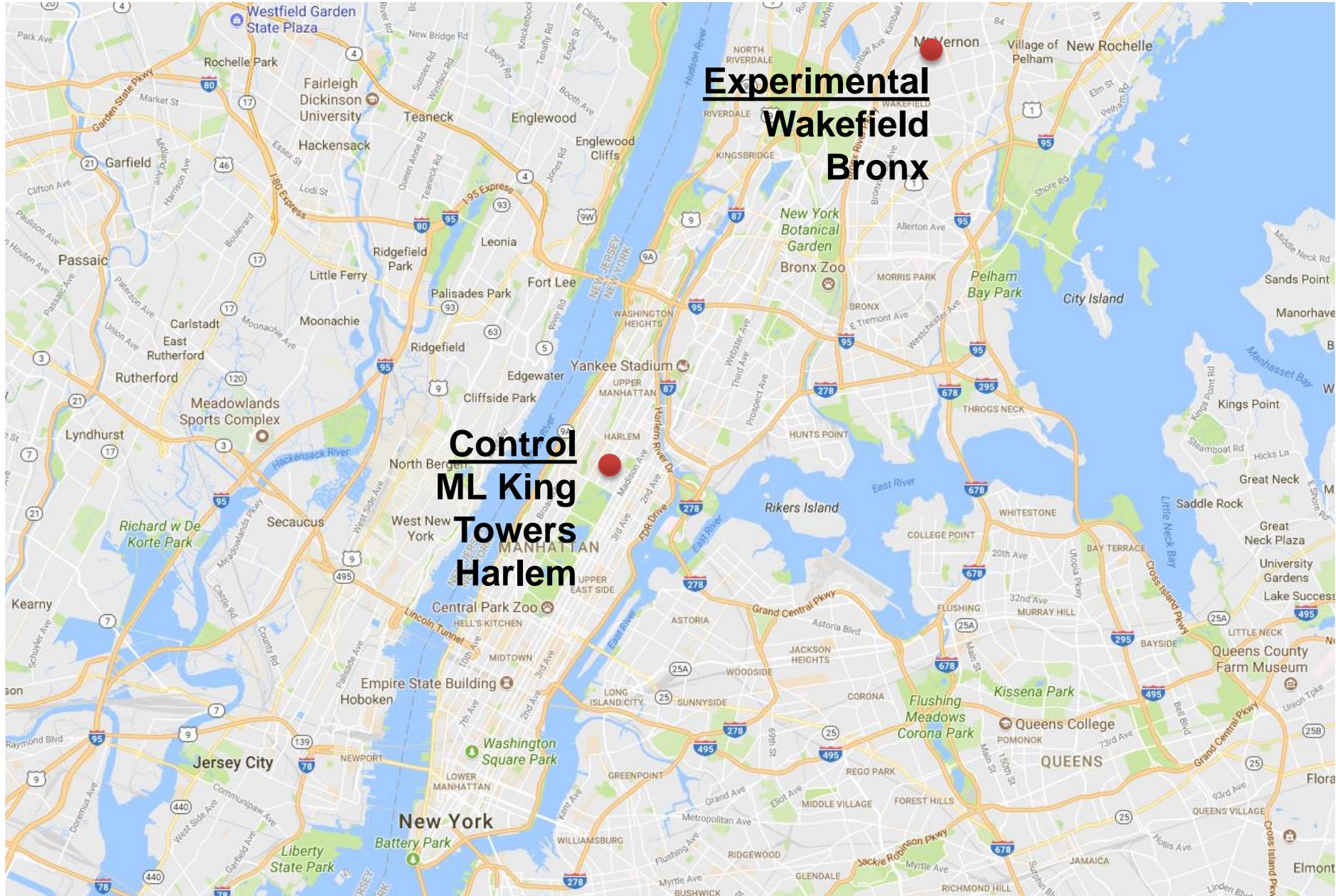
Moving to Opportunity Experiment

- Children who moved to low-poverty areas when young (e.g., below age 13) do much better as adults:

    - 30% higher earnings = $100,000 gain over life in present value
    - 27% more likely to attend college
    - 30% less likely to become single parents

- But moving had little effect on the outcomes of children who were already teenagers

- Moving also had no effect on parents' earnings

- Shows that exposure to better neighborhood during *childhood* is what matters most

Moving to Opportunity: Potential Concerns

1. Will helping families who want to move further destabilize low-income neighborhoods?

   - 20% of low-income families already move houses each year

2. Does integrating neighborhoods help the poor at the expense of the rich?

   - Mixed-income neighborhoods produce, if anything, slightly *better* outcomes for the rich

Policy Approach 2: Improving Neighborhoods

- Limits to scalability of policies that move people

  - Also need policies that improve existing neighborhoods

  - First step in identifying such policies: understand the characteristics of areas with high upward mobility
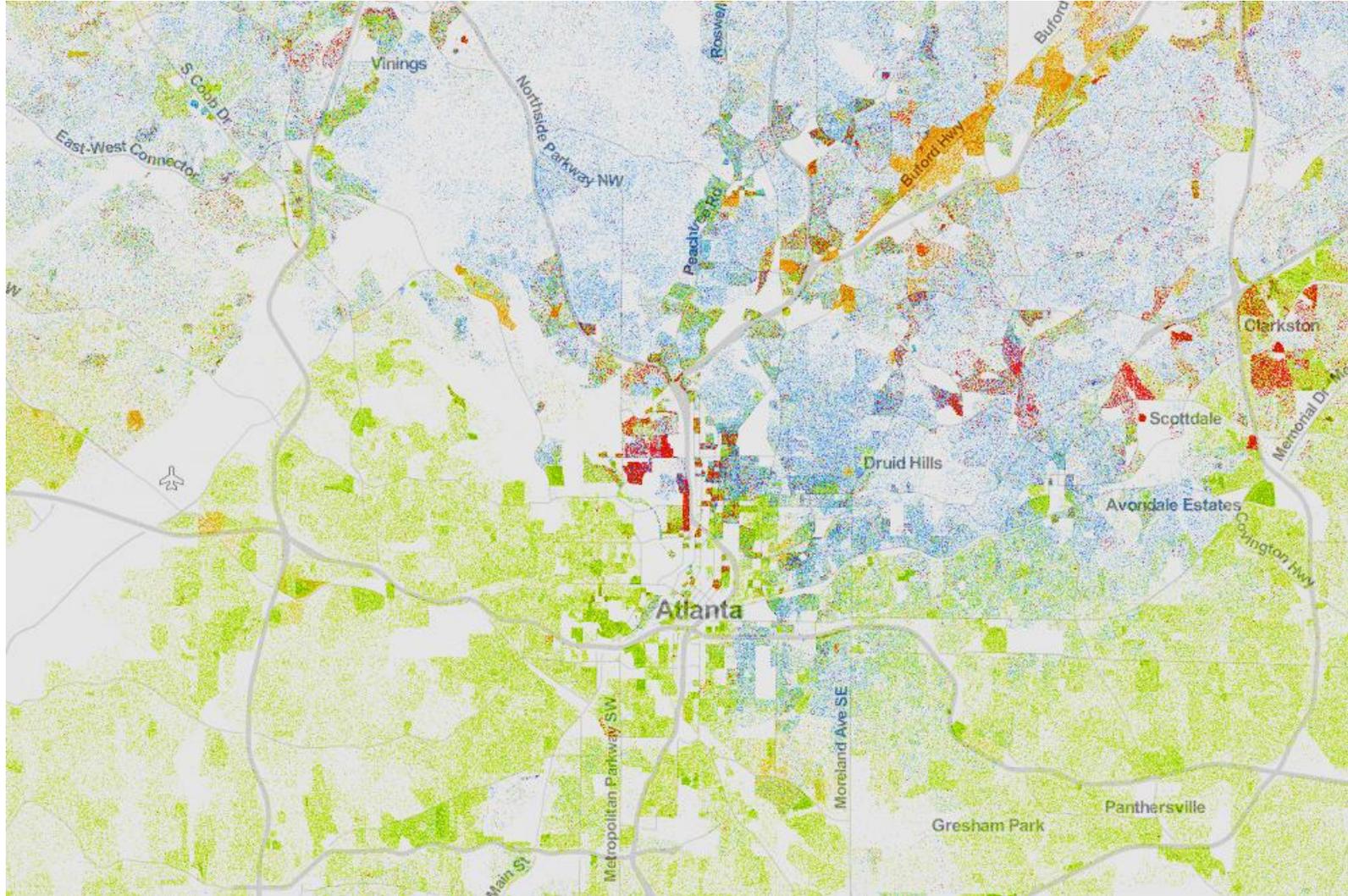
What are the Characteristics of High-Mobility Areas?
Five Strongest Correlates of Upward Mobility

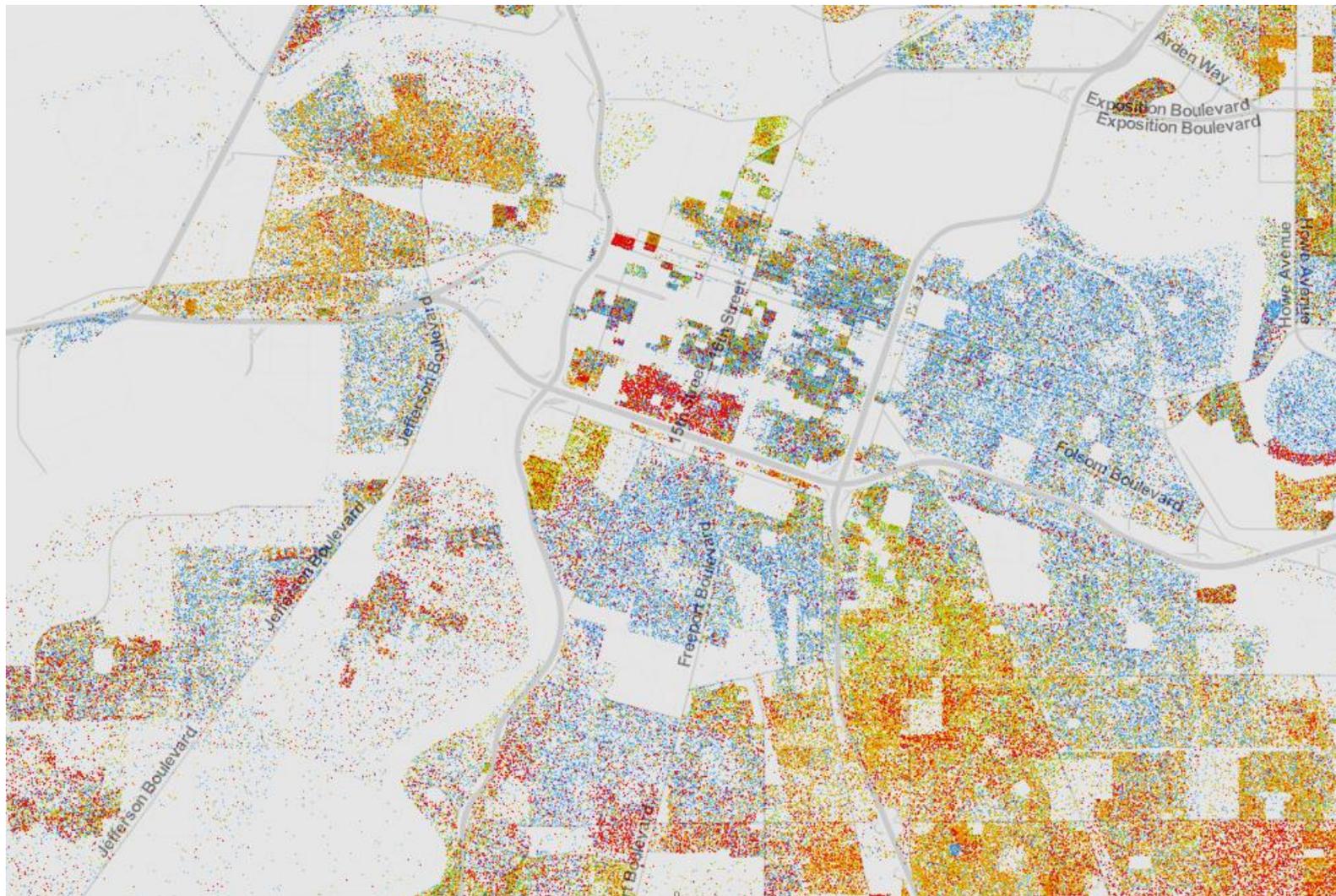1. Less residential segregation

Racial Segregation in Atlanta
Whites (blue), Blacks (green), Asians (red), Hispanics (orange)

Racial Segregation in Sacramento
Whites (blue), Blacks (green), Asians (red), Hispanics (orange)

Source: Cable (2013) based on Census 2010 data

What are the Characteristics of High-Mobility Areas?
Five Strongest Correlates of Upward Mobility

1. Less residential segregation

2. Larger middle class

3. More stable family structure

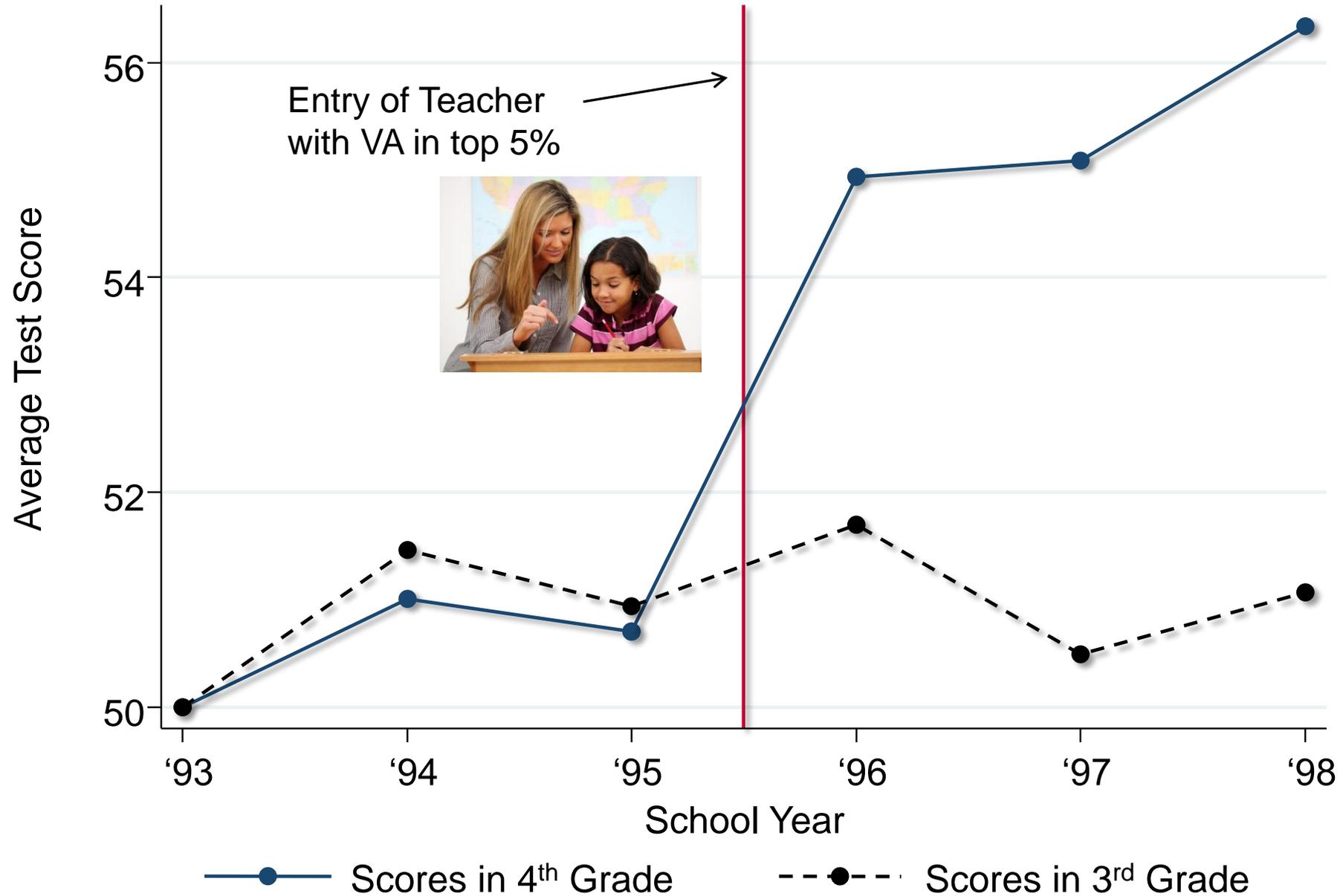4. Greater social capital

5. Better education

Measuring Teacher Quality: Test-Score Based Metrics

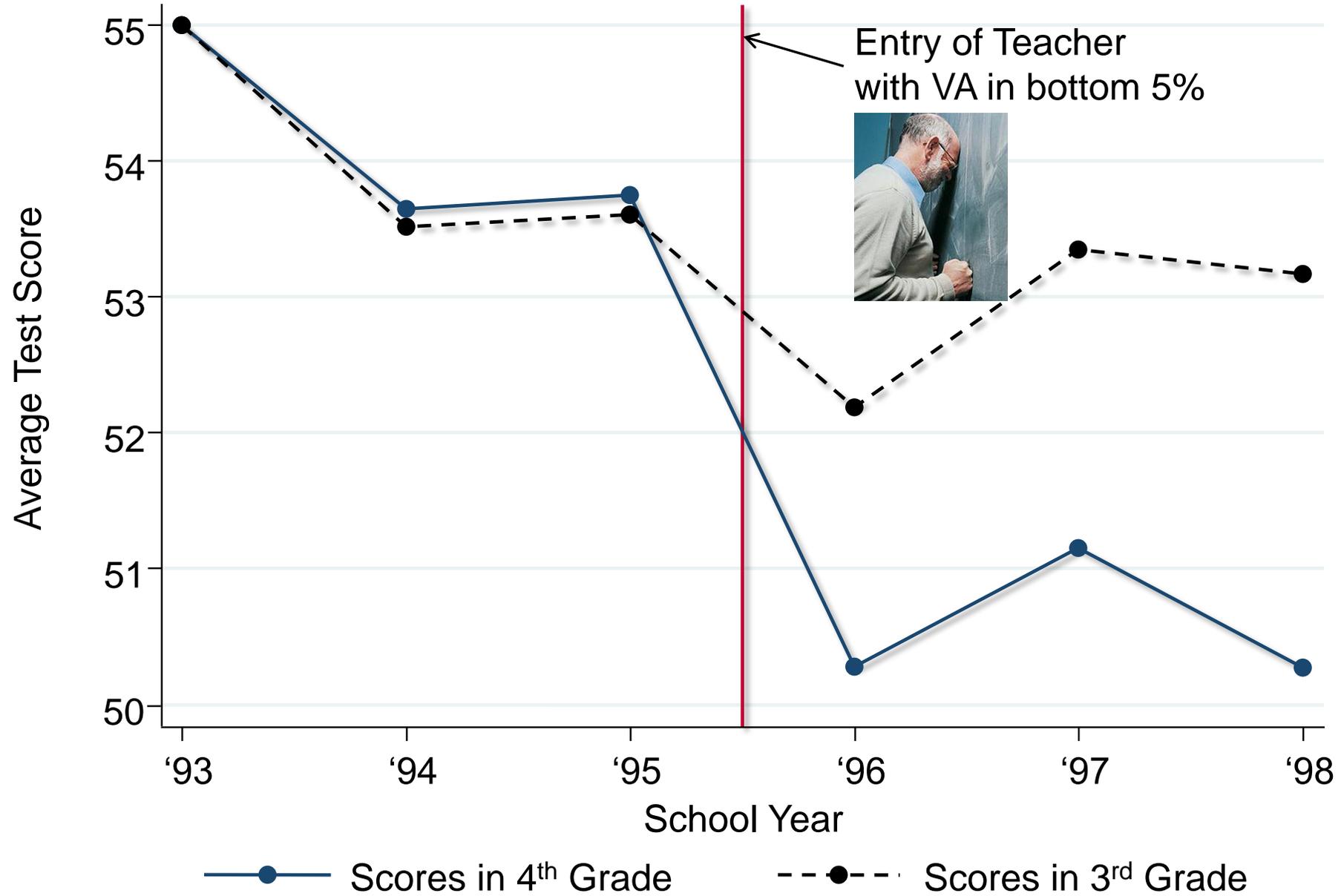One prominent measure of teacher quality: teacher *value-added*

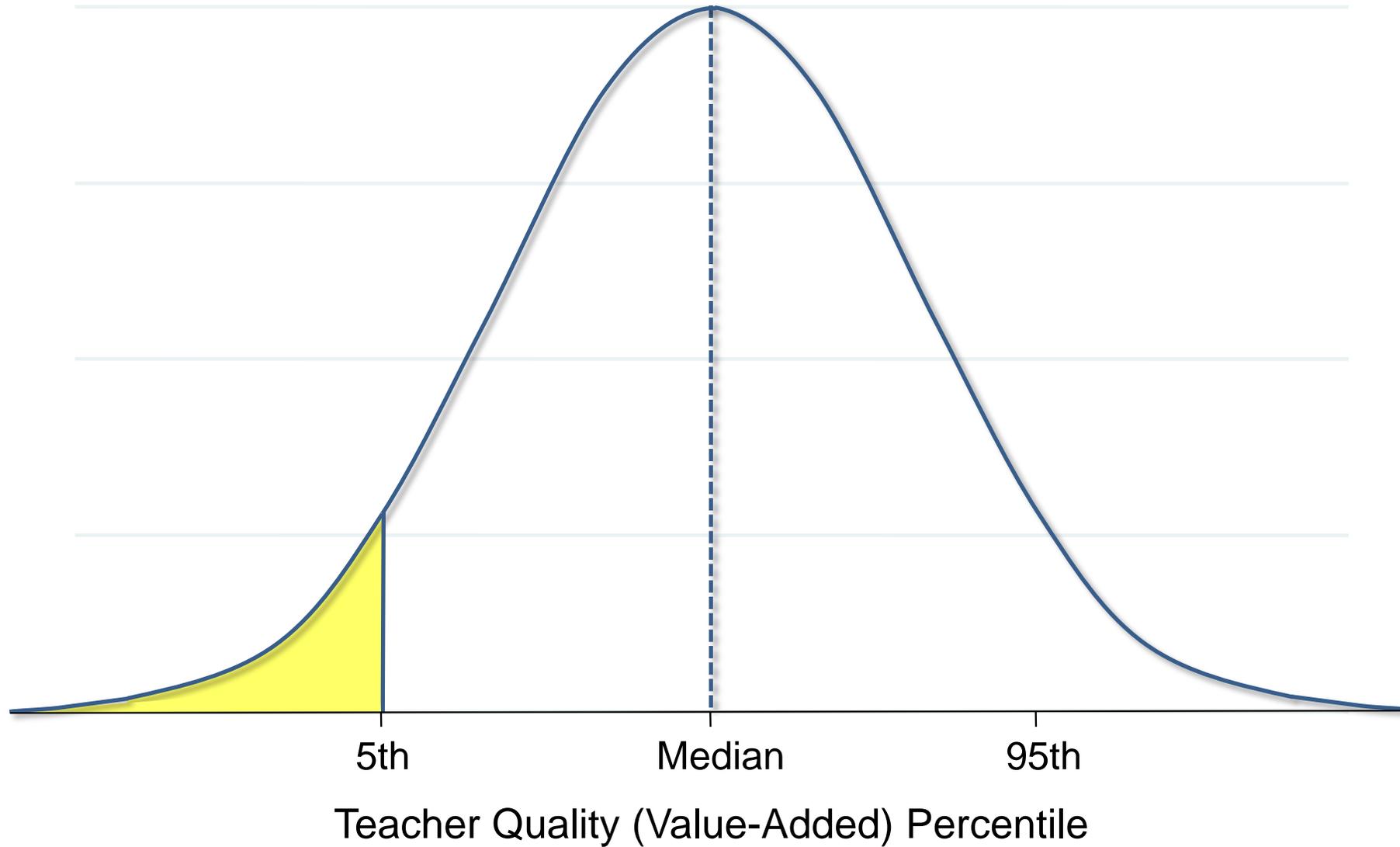How much does a teacher raise her/his students' test scores on average?

A Quasi-Experiment: Entry of High Value-Added Teacher

Entry of Teacher
with VA in top 5%

Average Test Score

56

54

52

50

'93   '94   '95   '96   '97   '98

School Year

●—— Scores in 4ᵗʰ Grade   ●--- Scores in 3ʳᵈ Grade

A Quasi-Experiment: Entry of Low Value-Added Teacher

Entry of Teacher with VA in bottom 5%

Average Test Score

School Year

Scores in 4th Grade

Scores in 3rd Grade

The Value of Improving Teacher Quality

5th   Median   95th

Teacher Quality (Value-Added) Percentile

The Value of Improving Teacher Quality

+$50,000 lifetime earnings per child
= $1.4 million per classroom of 28 students
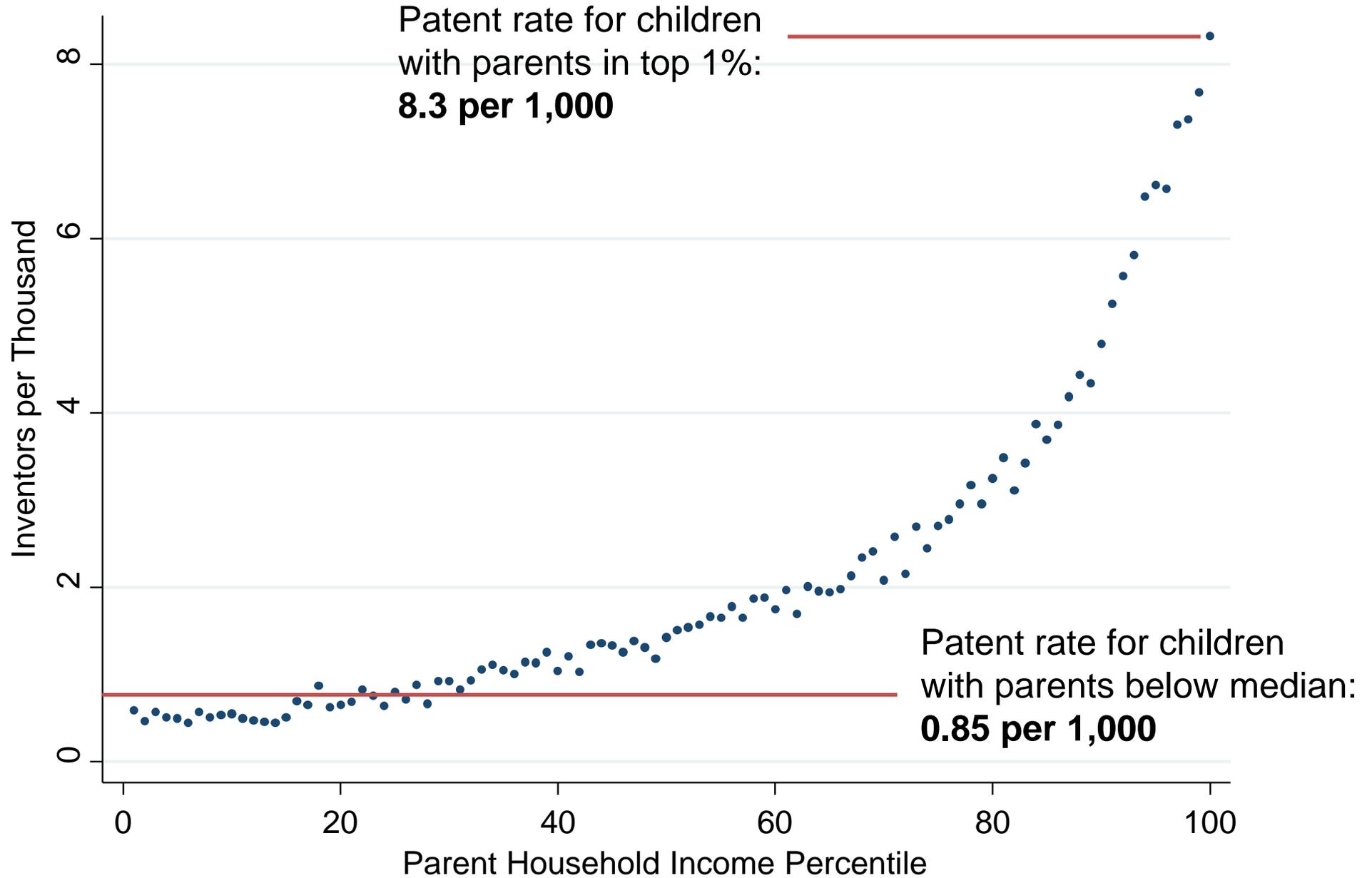= $250,000 in present value at 5% int. rate

5th   Media   95th
                         n
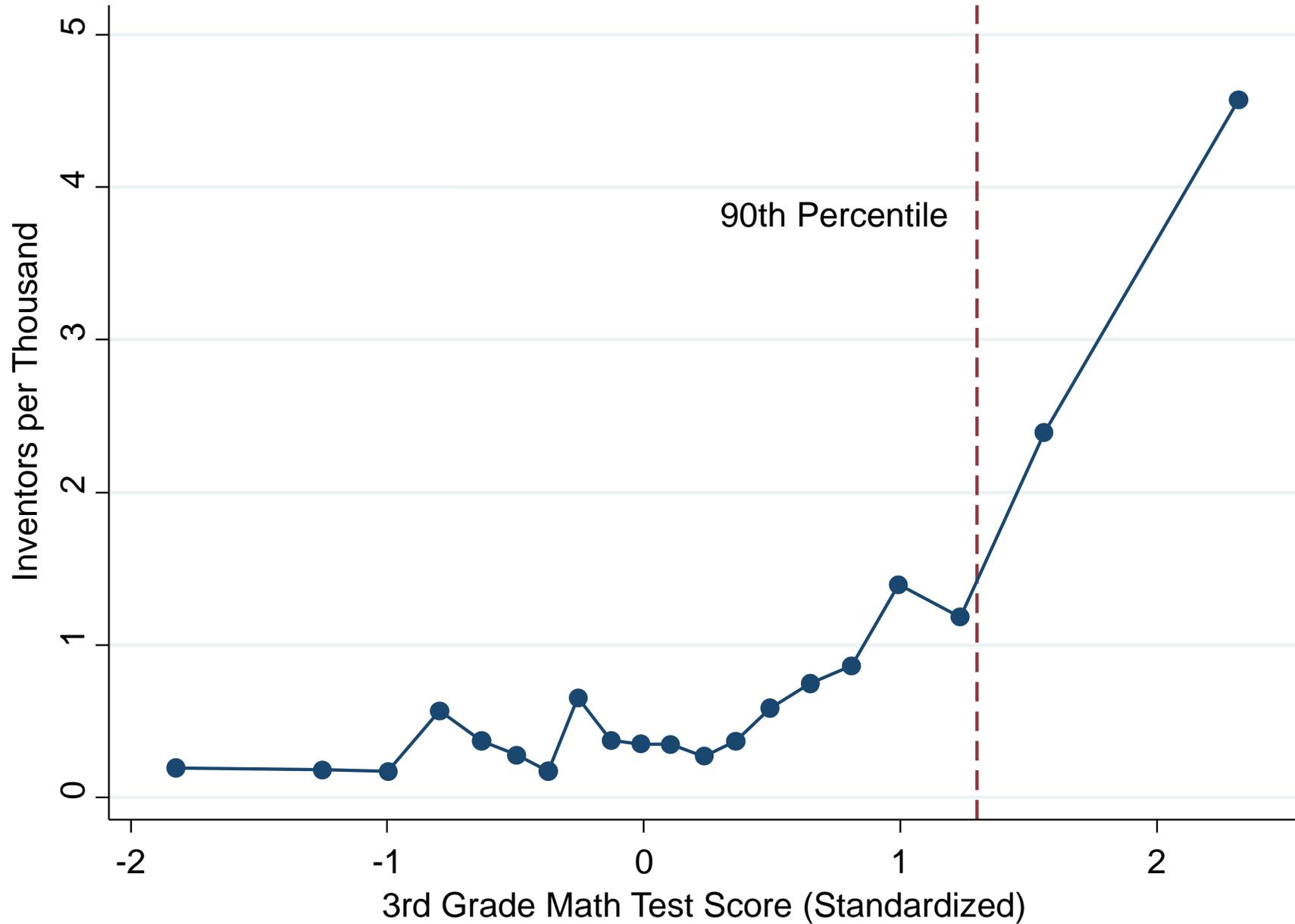Teacher Quality (Value-Added) Percentile

Equality of Opportunity and Economic Growth

- Traditional argument for greater social mobility is based on principles of justice

- But improving opportunities for upward mobility can also increase size of the economic pie

- To illustrate, focus on innovation

  - Study the lives of 750,000 patent holders in the U.S.
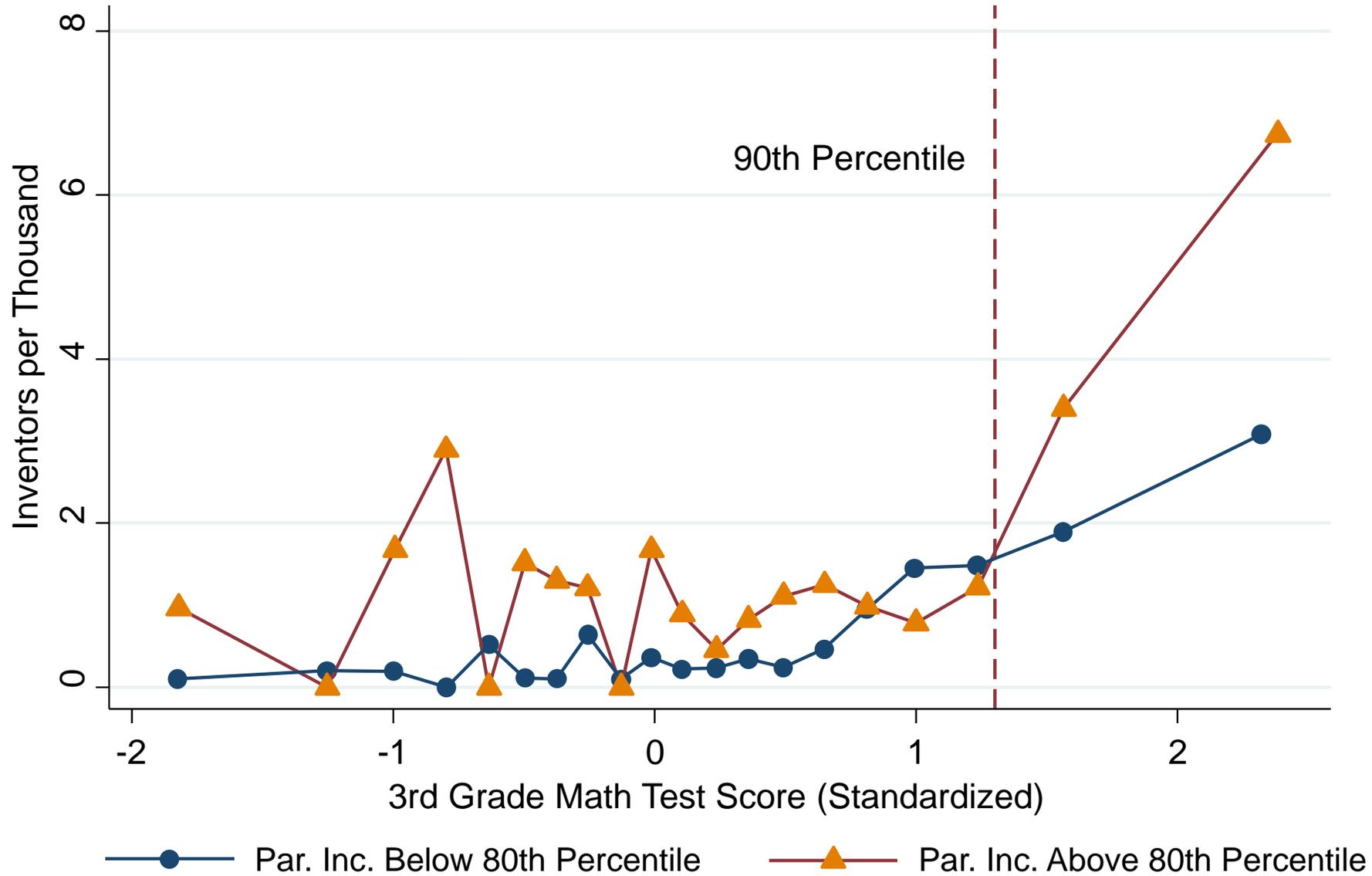
Patent Rates vs. Parent Income Percentile

Patent rate for children
with parents in top 1%:
8.3 per 1,000

Patent rate for children
with parents below median:
0.85 per 1,000

Inventors per Thousand

Parent Household Income Percentile

Source: Bell, Chetty, Jaravel, Petkova, van Reenen 2017

Patent Rates vs. 3rd Grade Math Test Scores

90th Percentile

Inventors per Thousand

3rd Grade Math Test Score (Standardized)

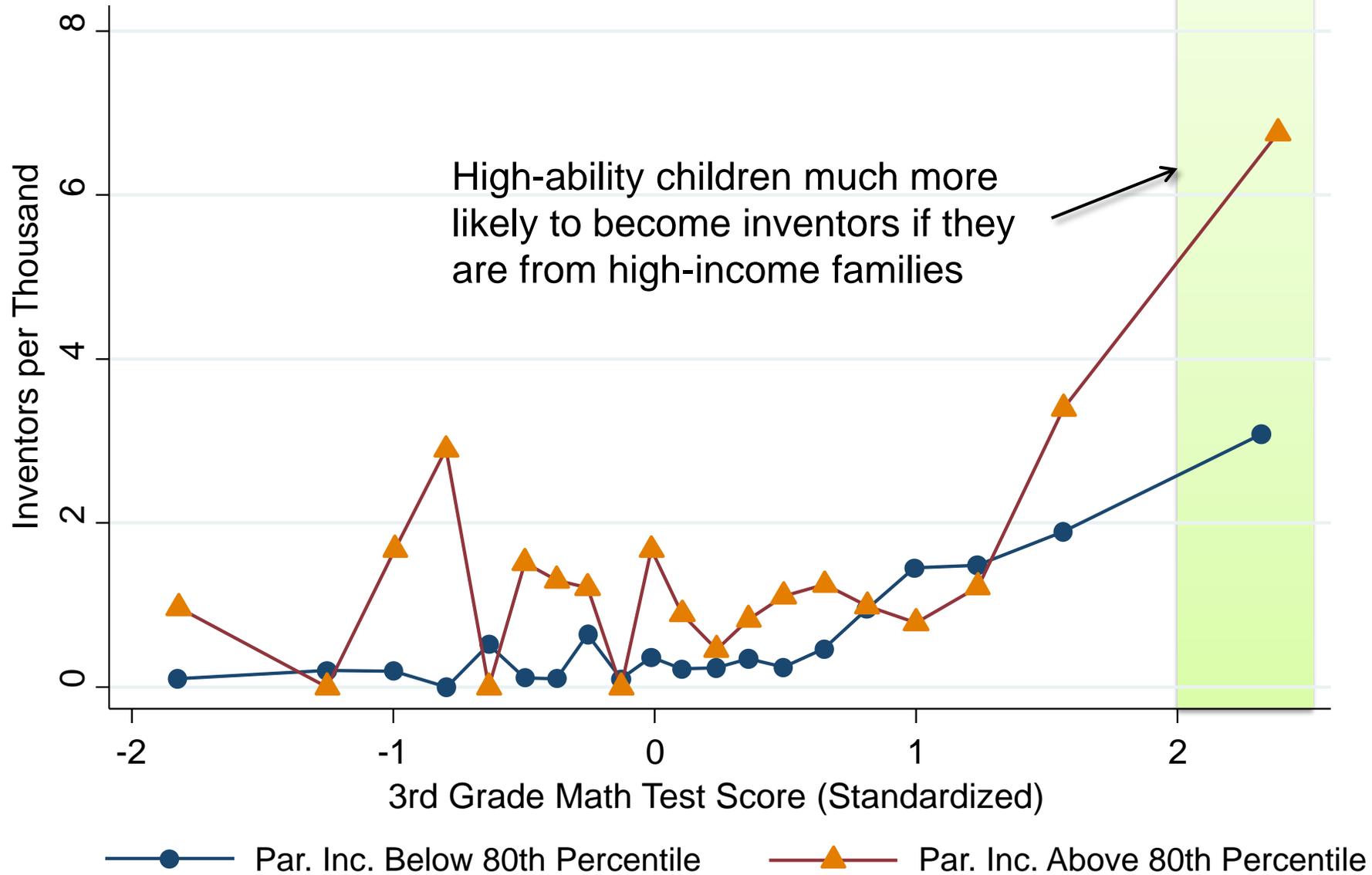**Patent Rates vs. 3rd Grade Math Test Scores**
For Children with Low vs. High Income Parents

Patent Rates vs. 3rd Grade Math Test Scores
For Children with Low vs. High Income Parents

High-ability children much more
likely to become inventors if they
are from high-income families

Inventors per Thousand

3rd Grade Math Test Score (Standardized)

Par. Inc. Below 80th Percentile   Par. Inc. Above 80th Percentile

The Origins of Inventors
Patent Rates per 1000 Children by CZ where Child Grew Up

> 3.12

2.62 – 3.12

2.16 – 2.62

1.80 – 2.16

1.48 – 1.80

1.25 – 1.48

0.92 – 1.25

0.69 – 0.92

0.44 – 0.69

< 0.44

Missing Data
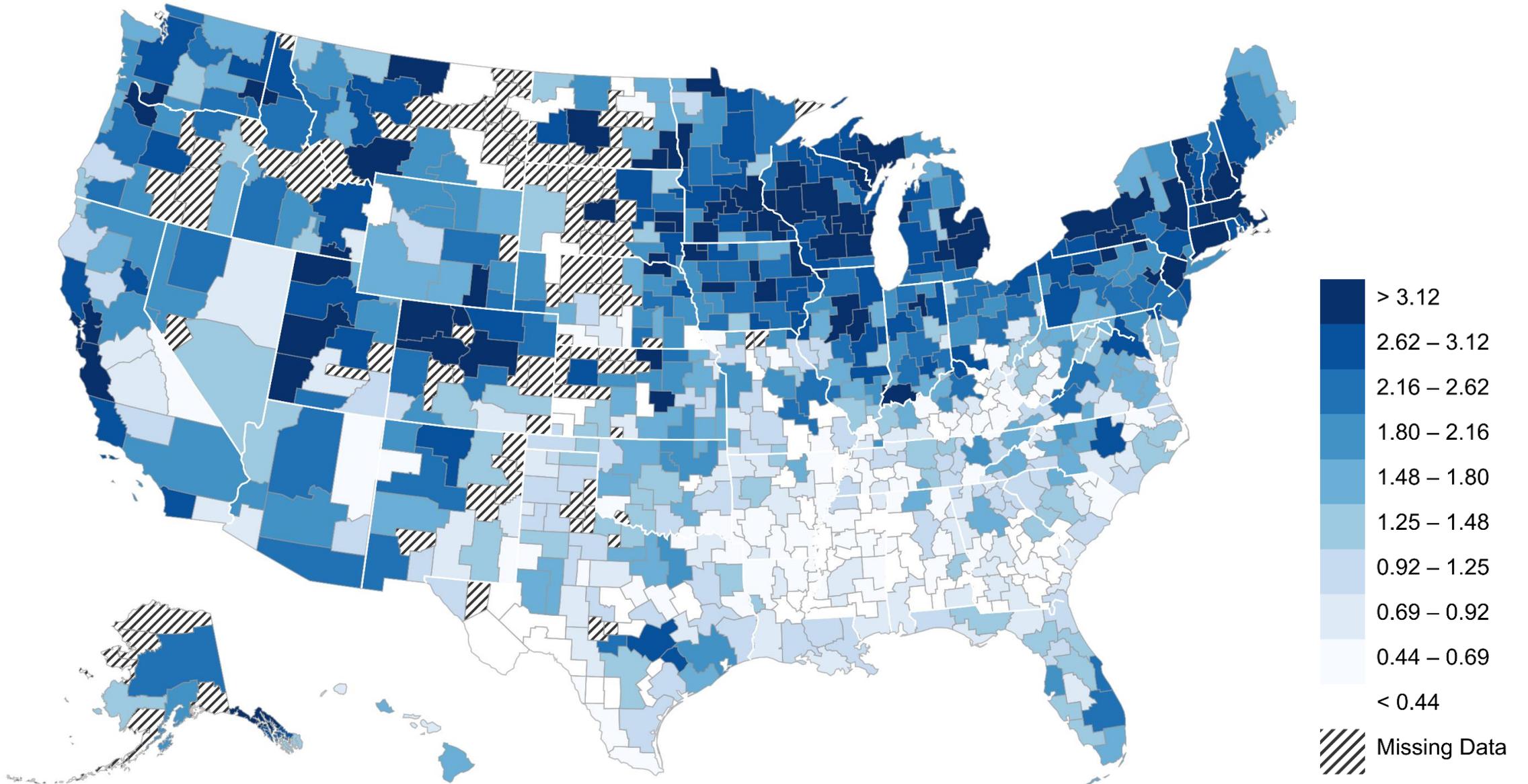
Policy Lessons and Future Work

1. Increase opportunity at a local, not just national level

    ▪ Target areas that currently offer less opportunity

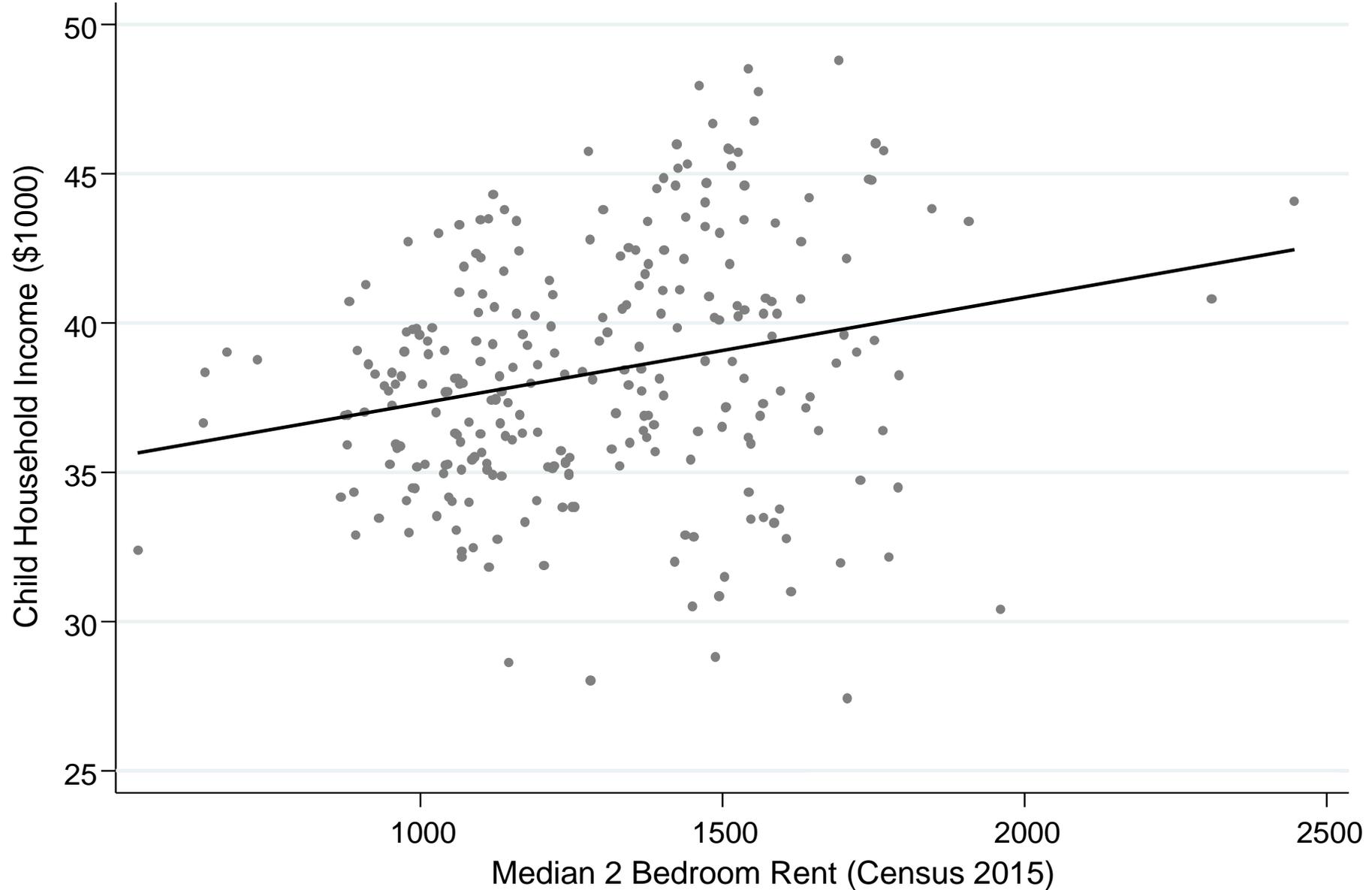   ▪ Ongoing research: map opportunity by ZIP code and Census tract to identify "opportunity bargains"

The Geography of Upward Mobility in Seattle

Household Income for Children who Grow Up in Low-Income (25th Percentile) Families
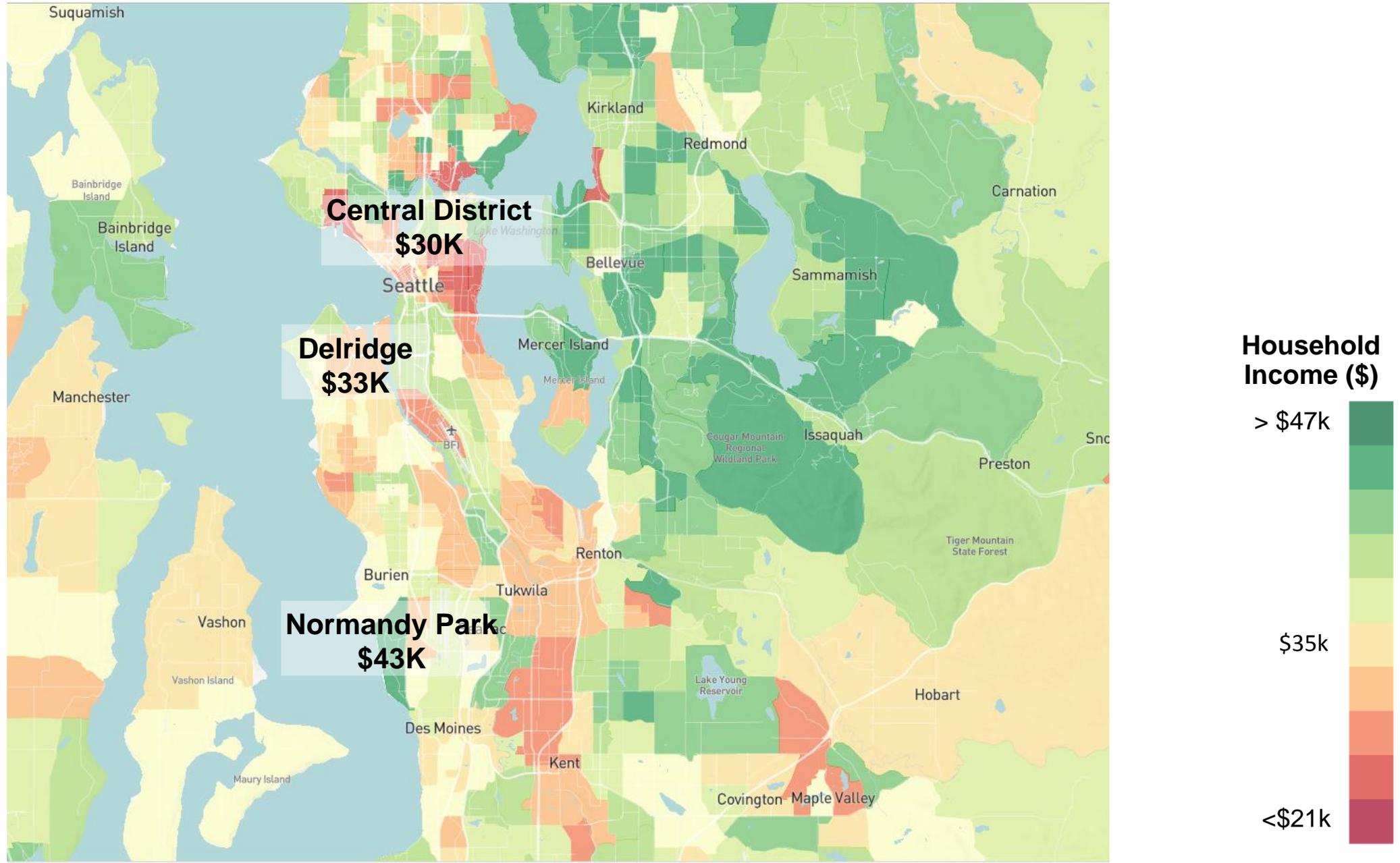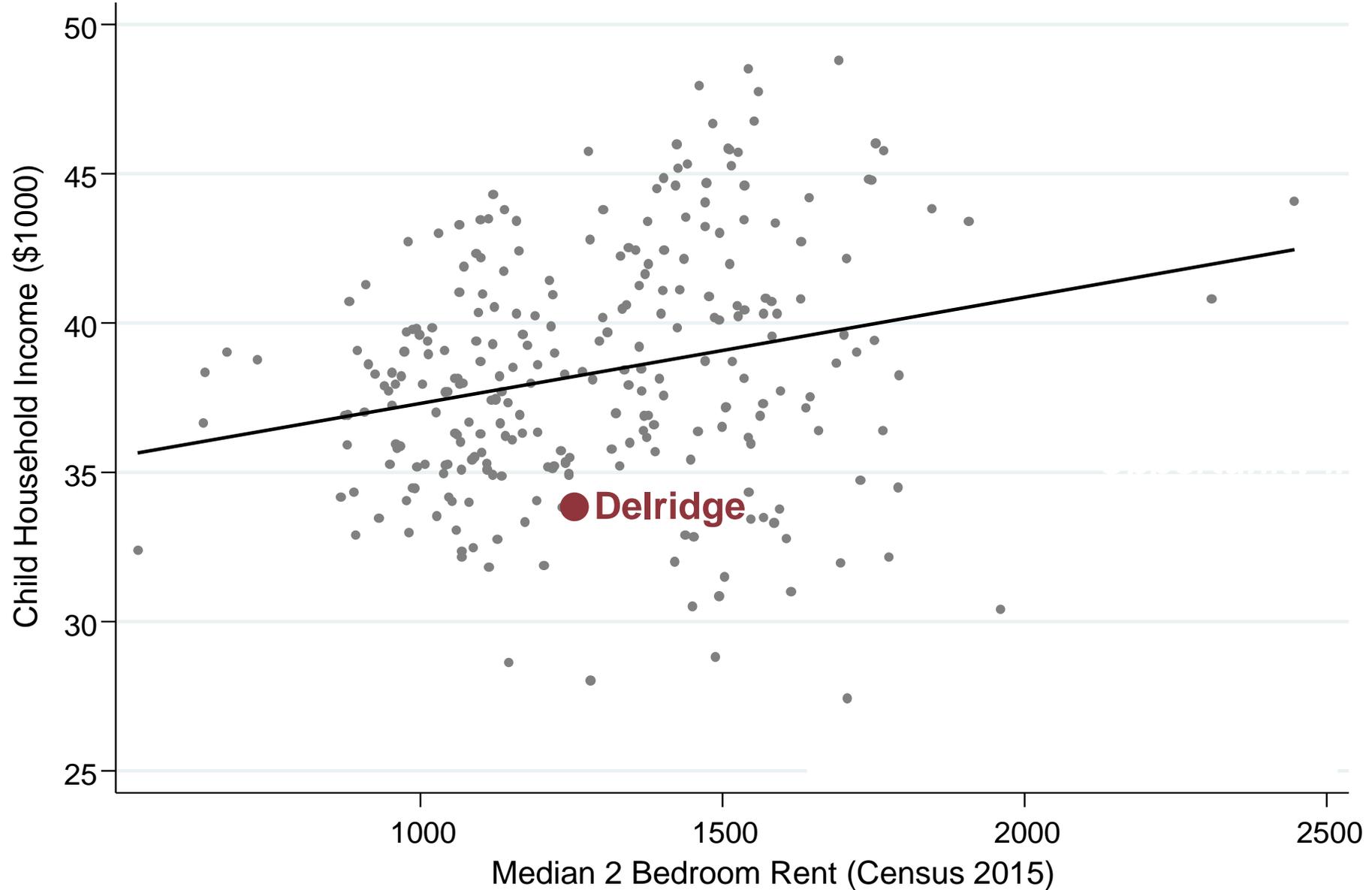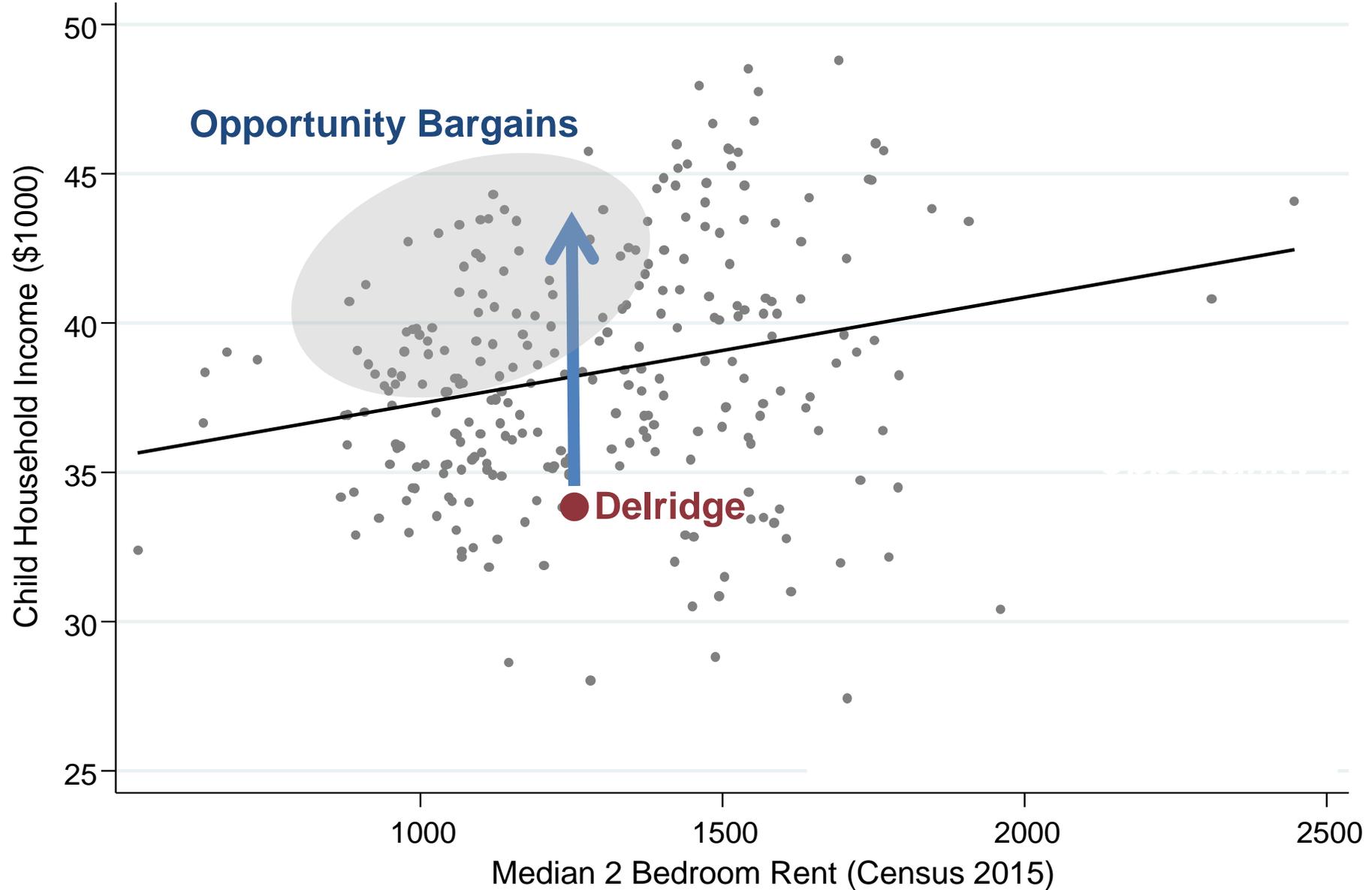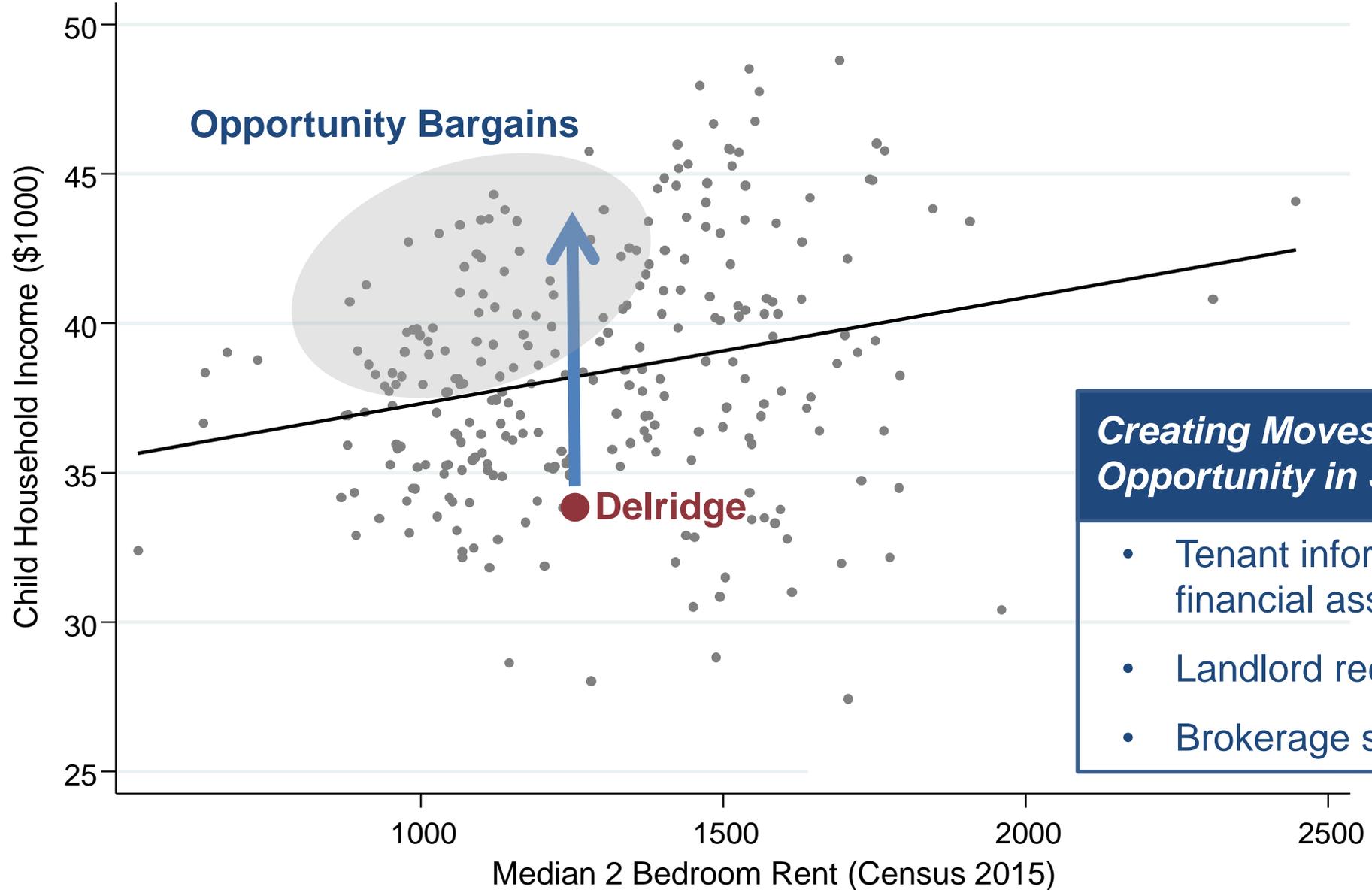
The Price of Opportunity in Seattle
Upward Mobility versus Median Rent by Neighborhood

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Opportunity Bargains

Delridge

Child Household Income ($1000)

Median 2 Bedroom Rent (Census 2015)

The Price of Opportunity in Seattle
Upward Mobility versus Median Rent by Neighborhood

Opportunity Bargains

● **Delridge**

Creating Moves to Opportunity in Seattle

- Tenant information and financial assistance
- Landlord recruitment
- Brokerage services

Child Household Income ($1000)

Median 2 Bedroom Rent (Census 2015)

Policy Lessons and Future Work

1. Increase opportunity at a local, not just national level

2. Improve childhood environments

   - Not just spending more money: U.S. already spends more on education than countries with better outcomes

   - Ongoing research: studying changes in local policies using historical panel of tract-level data on upward mobility

Policy Lessons and Future Work

1. Increase opportunity at a local, not just national level

2. Improve childhood environments

3. Reshape social norms and aspirations

    ▪ How can we create more connected communities?

    ▪ Ongoing research: studying how networks affect poverty and well-being across areas using Facebook data

Policy Lessons and Future Work

1. Increase opportunity at a local, not just national level

2. Improve childhood environments

3. Reshape social norms and aspirations

4. Harness "big data" to develop a scientific evidence base for economic and social policy

   ▪ County and college-level data on upward mobility publicly available at www.equality-of-opportunity.org

   ▪ Ongoing work: policy translation arm to help local governments increase mobility out of poverty

The Fading American Dream
Percent of Children Earning More than Their Parents, by Year of Birth

Pct. of Children Earning more than their Parents

Child's Year of Birth
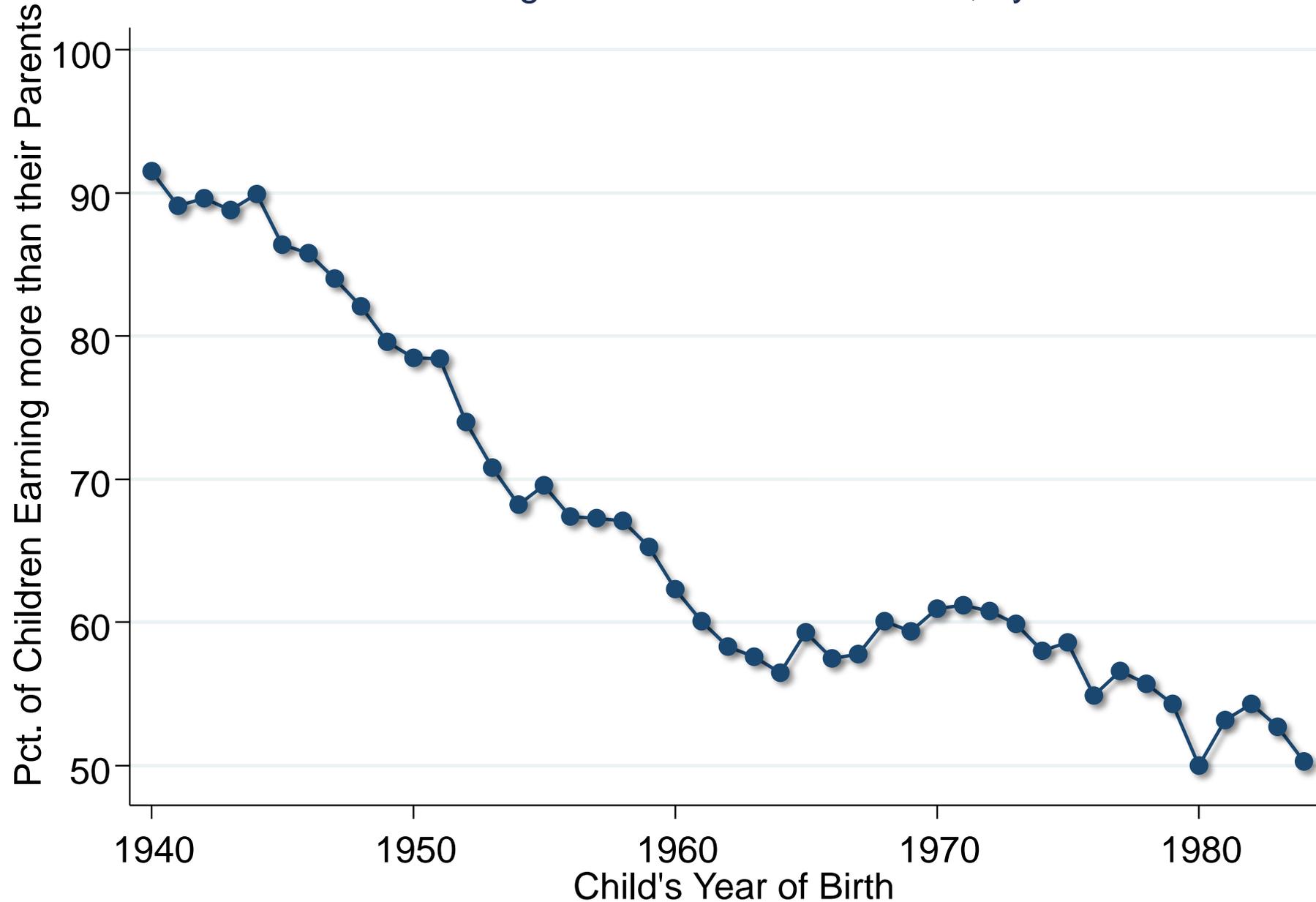
Source: Chetty, Grusky, Hell, Hendren, Manduca, Narang (Science 2017)